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system attached to said body, and which body rides on at least two wheels with a steering system attached to said body, the improvement wherein said reactor produces hydrogen by reaction of a metal catalyst in contact with a solution of sodium borohydride in water.

#### **REMARKS**

The information disclosure statement, drawings, specification, and claims have been carefully reviewed in light of the Examiner's action.

Legible copies of all listed patents on disclosure statement citation are enclosed with this Amendment.

Specification was amended to correct minor grammatical errors, and Fig. 16A description was added, as per the Examiner's request.

Claims 1,2,3,9,10,11, and 27 were corrected to eliminate grammatical informalities and to provide antecedents basis into them.

Claims 7 and 8 have been canceled.

New claims 28,29 and 30 have been added and are supported by specification.

No new matter has been added.

Taking claims in detail, attention will be given to the prior art patents cited by the Examiner.

#### **ITEM 7**

The Examiner rejected the claims 1-3 based on obviousness of a combination of prior patents to West (U.S. 3,517,766), and Munday (U.S. 5,143,025). Applicant defends Claim 1 on the grounds, that Claim 1 does not include electrolysis apparatus of Munday, so the Examiner's argument of combination does not apply to Claim 1. The tank 16 in Munday's patent is not a hydrogen storage system as claimed by applicant, but it is only a housing of electrolysis apparatus. No hydrogen is stored in it, since the hydrogen is produced on demand only, which is the main subject matter of Munday's patent. Furthermore, Munday does not have a generator as a source of electricity, does not have electric motor, and does not suggest an electric hybrid vehicle.

Applicant agrees with the Examiner that West disclosed an electric hybrid vehicle, which is using a polluting gasoline engine with generators and a battery powering an electric motor to propel the vehicle.

However, West does not suggest that his vehicle is fueled by non-polluting hydrogen, and none of the references suggests that the range of hydrogen fueled vehicles can be extended by electric hybrid configuration, as described in applicant's specifications, page 29, lines 9-20.

Applicant believes that Examiner's combination of references is improper, because nothing in the references cited by the Examiner suggests the system of applicant.

Applicant is the first to teach the novel and unobvious, long range and non-polluting hydrogen-electric hybrid vehicle, and the Examiner's combination of references does not apply to Claim 1 and also does not meet the Applicable Court Standards, which are appended to this Amendment.

In combining references, the Examiner did not and could not:

1. Find any suggestion of the desirability of the proposed combination;
2. Find any suggestion for combining the references in the references themselves;
3. Find any suggestion in the references taken as a whole of the structure claimed;
4. Find the actual structure as claimed and employed to achieve a new and unexpected result.

Applicant defends Claim 2 on the grounds, that none of the references even remotely suggest combination or system of applicant, as claimed in Claim 2, or even that they can be selectively combined.

West and Munday fail to teach the electric supply of the electrolysis device to be both, the generator and battery. West does not have the electrolysis device, Munday does not have the generator and does not suggest a hybrid electric vehicle.

Applicant believes that the Examiner's combination of references to reject the Claim 2 does not meet the Applicable Court Standards, as appended to this Amendment. In combining references, the Examiner did not and could not:

1. Find any suggestion of desirability of the proposed combination;
2. Find any suggestion for combining the references in the references themselves;
3. Find any suggestion in the references taken as a whole of the structure claimed;
4. Find the actual structure as claimed and employed to achieve a new and unexpected result.

Claim 3 defines two sources of hydrogen for the engine of the electric hybrid vehicle:

The hydrogen storage (tank) system and the hydrogen generating cell. West discloses an electric hybrid vehicle with gasoline fueled engine, but does not suggest the hydrogen fuel from any source. Munday does not power the electrolysis device by generator, and does not supply hydrogen from two sources. None of the references cited by the Examiner even remotely suggests the combination or system of the applicant, as claimed in Claim 3. Applicant believes, that his invention is un-obvious, because nobody disclosed it or reduced it to practice as claimed, before the time of the applicant invention, and that the Examiner's claim rejection does not meet Applicable Court Standards, as appended to this Amendment.

In combining references, the Examiner did not and could not:

1. Find any suggestion of the desirability of the proposed combination;
2. Find any suggestion for combining the references in the references themselves;
3. Find any suggestion in the references taken as a whole of the structure claimed;
4. Find the actual structure as claimed and employed to achieve a new and unexpected result.

#### ITEMS 8 and 9

Applicant agrees with the Examiner that carbon graphite and metal hydride are known hydrogen absorbents, but believes that Claims 4 and 5 should be allowed, because they are dependent on Claims 1 and 3 with all of their limitations.

#### ITEM 10

Applicant believes that Claim 6 should be allowed, especially because there is no disclosure to be found on the record, that mesocarbon microbeads are known to be used as hydrogen absorbent/desorbent, either alone, or in a combination with graphite and metal hydride. Mesocarbon microbeads do not have a great surface area as the Examiner stated. Just the opposite, and for that reason they are used in high density electrodes. Applicant had found that mesocarbon microbeads absorb hydrogen into internal structure of their spheres. Additionally, the Claim 6 is dependent on Claims 1 and 3 with all their limitations.

#### ITEM 11

Applicant cancels the Claims 7 and 8 in view of Hart (U.S. 4,124,741) and agrees with the Examiner that fuel cell vehicle is otherwise well known.

#### ITEM 12

Applicant believes that Claim 9 and 10 should be allowed. Although the fuel cell vehicle is known, the mixture of carbon graphite, mesocarbon microbeads and metal hydride is not known as hydrogen storage medium, and especially mesocarbon microbeads (MCMBs); as explained in Item 10 above. Any porous material will not absorb or desorb hydrogen as the Examiner implied, therefore it is not obvious. MCMBs do not have a great surface area, as the Examiner wrongly stated. Just the opposite. Applicant does not claim invention of two wheeled vehicle, which carries at least one passenger. However, the above hydrogen storage maybe used in any fuel cell vehicle, and therefore, the Claims 9 and 10 are written to encompass even the smallest one, and the claims are supported by specification.

### ITEM 13

Applicant believes that Claims 11/1 and 28 should also be allowed ,because Tangri (U.S. 4,085,709) does not even remotely suggests vehicle combination of applicant , as well as West and Munday, as discussed above in Item 7. Applicant agrees that Tangri uses similarly an electrolyzer connected to an outside source, but applicant's system does not have Tangri's heavy and bulky compressor to compress the hydrogen , as shown in Fig.25 of this patent. West also does not have the electrolyzer, as the Examiner wrongly stated. Examiner's rejection does not meet Applicable Court Standards, as appended to this Amendment. Claim 11/3 has been rewritten as new Claim 28 to meet Examiner's request.

### ITEM 14

Claims 11/7 and 11/8 are canceled, because Claims 7 and 8 have been canceled, in agreement with the Examiner, in view of Hart patent.

### ITEM 15

Claims 11/9 and 11/10 are defended similarly as Claims 11/1 and 11/3 (28) in Item 13, and additionally on the grounds that Claims 9 and 10 are patentable as explained in Item 12. Although the fuel cell vehicle of Werth is known, Hart's patent does not provide for hydrogen storage as claimed in Claims 9 and 10. Werth vehicle is also different from Claim 10, which does not include a battery ,and Werth does not have an electrolyzer as the Examiner wrongly stated. In all references cited by the Examiner there is no suggestion of applicant's vehicle combination, as claimed in Claims 11/9 and 11/10. Therefore, the Examiner's rejection does not meet Applicable Court Standards, as appended to this Amendment.

#### ITEM 16

Applicant believes that the Examiner misunderstood the Claim 26. Laumann at al. (U.S. 4,112,875) does not have the open to air engine of applicant, therefore Laumann has to return all gases back to the intake ,due to totally closed loop of his inert gas system.

The purpose of Applicant's only partial return of exhaust gases (which included H<sub>2</sub>O) is to cool the hydrogen combustion chamber, and thus prevent premature ignition. This eliminates the need in the open to air hydrogen fueled engine for extra cooling water injection from an outside source, as described in Page 29, lines 1-8. There is no suggestion in the references cited by the Examiner of applicant's vehicle combination, as claimed in Claim 26, and no suggestion of partial return of exhaust gases of the open to air engine to cool the combustion. Therefore the Claim 26 should be allowed.

#### ITEM 17

Applicant defends Claims 27/1 and 27/3 on the grounds that Werth and Munday do not suggest vehicle as claimed in Claims 1 and 3, as explained in Item 7, and that Kerrebrock at al. (U.S. 5,372,617) does not disclose the same hydrogen generating reactor ,as described by applicant. Kerrebrock reacts sodium borohydride with water, but applicant reacts solution of sodium borohydride in water with a metal catalyst , such as ruthenium, coated by ion exchange on high surface polymer beads, which is much safer. Again, none of the references suggests combination of applicant. Applicant therefore believes that Claim 27 is patentable and should be allowed.

#### ITEM 18

Claims 27/7 and 27/8 are canceled, because Claims 7 and 8 are canceled in view of Hart.

#### ITEM 19

Applicant believes that the Examiner means Claims 27/9 and 27/10 (not 11/9 and 11/10). Applicant defends Claims 27/9 and 27/10 similarly as in Item 12, and additionally as in Item 17. There is no electrolyzer powered from an external source claimed in Claim 27,


as the Examiner erroneously stated in his action, and additionally Kerrebrock uses a different reaction for production of hydrogen. Therefore Claim 27 is patentable and should be allowed. Claims 29 and 30 have been added to claim fuel cell vehicles with hydrogen generating reactor.

**ITEM 20**

Applicant believes that there are no Double patenting issues between the instant application and co-pending application #08,950,445. Instant Claims 1,2, and 3 may be similar to Claims 10,11, and 12 of Application 08/950,445, but they are better defined and better supported by instant specification, which is a continuation in part of the prior Application #08/950,445.

It is believed that the claims define new and unobvious subject matter. Accordingly it is believed that the Amendment places the application in condition for allowance and such action is requested and urged.

Respectfully submitted,

  
Joseph B. Kejha  
(Applicant)